

	Type	L #	Hits	Search Text
1	BRS	L1	66	plate adj modulation
2	BRS	L2	330268	amplifier
3	BRS	L3	9	1 with 2
4	BRS	L4	15	1 same 2
5	BRS	L5	3313	(am or (amplitude adj modulation)) with amplifier
6	BRS	L6	581	455/127.2-127.3,108.ccls.
7	BRS	L7	92	5 and 6

	DBs	Time Stamp	Comments	Error Definition
1	USPAT; US-PGPUB	2004/05/22 06:58		
2	USPAT; US-PGPUB	2004/05/22 06:58		
3	USPAT; US-PGPUB	2004/05/22 06:58		
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7	USPAT; US-PGPUB	2004/05/22 07:03		

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4	0
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7	0



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- (21) Appl. No.: 09/055,165

- (22) Filed: Apr. 4, 1998

Related U.S. Application Data

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- (51) Int. Cl.⁷ H04B 1/04
- (52) U.S. Cl. 455/108; 455/93; 455/102;
455/108; 455/127; 330/199; 330/200; 332/149;
332/159
- (58) Field of Search 455/108, 93, 102,
455/127; 332/149, 159, 151; 330/200, 199,
136, 110

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 4.199,723 * 4/1980 Cummings et al. 455/108

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|-----------|-----------|---------------------|---------|
| 5,060,294 | * 10/1991 | Schwent et al. | 455/93 |
| 5,175,877 | * 12/1992 | Streeter | 455/102 |
| 5,239,693 | * 8/1993 | Gailus et al. | 455/126 |
| 5,469,127 | * 11/1995 | Hulick et al. | 332/149 |
| 5,524,285 | * 6/1996 | Wray et al. | 455/126 |
| 5,771,442 | * 6/1998 | Wang et al. | 455/102 |
| 5,929,702 | * 7/1999 | Myers et al. | 330/10 |

* cited by examiner

Primary Examiner—Lee Nguyen

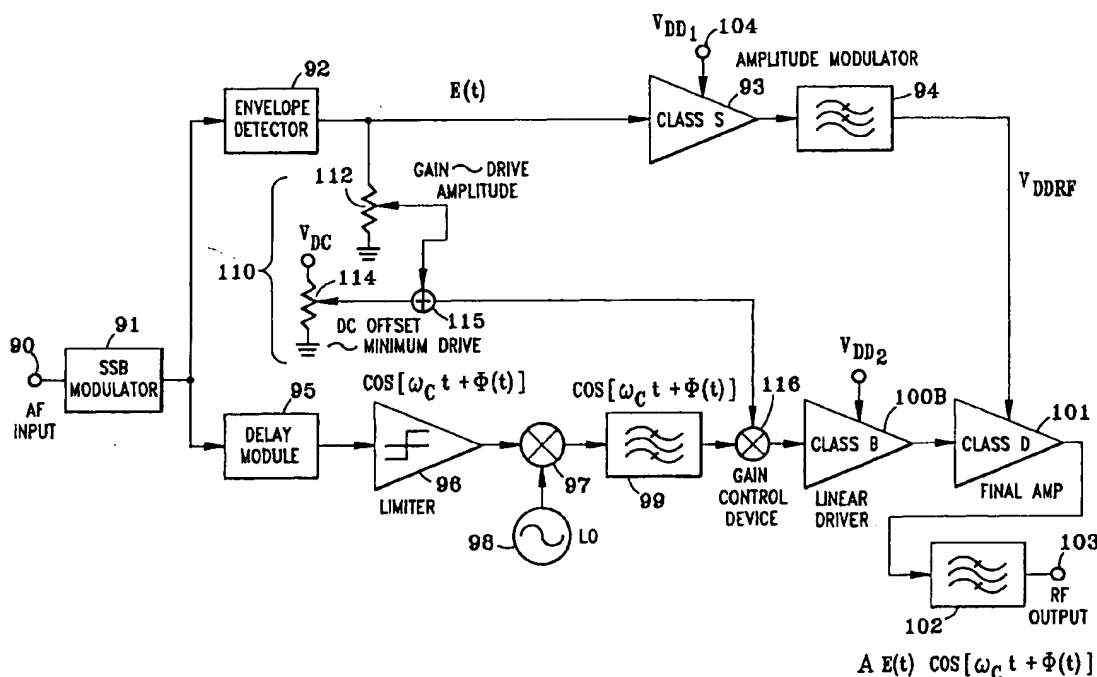
Assistant Examiner—Simon Nguyen

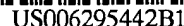
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(57) **ABSTRACT**

A method and a circuit for high-efficiency linear RF-power amplification over a wide range of amplitudes from zero to peak output includes a final RF-power amplifier operating at or near saturation, an RF driver amplifier, a high-level amplitude modulator for the final amplifier, preferably a high-level amplitude modulator for the driver amplifier, and a means for determining the supply-voltage input to the final amplifier and for controlling the amplitude of the drive. The means for determining the supply-voltage input and for controlling the amplitude acts so that the final amplifier drive varies from a minimum level to peak as the desired transmitter output varies from zero to peak. The transmitter is preferably of the envelope-elimination-and-restoration type or the envelope-tracking type.

32 Claims, 13 Drawing Sheets





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- 26 Claims, 7 Drawing Sheets**

